

No. 623,983.

Patented May 2, 1899.

E. E. CLAUSSEN & H. ELSAS.

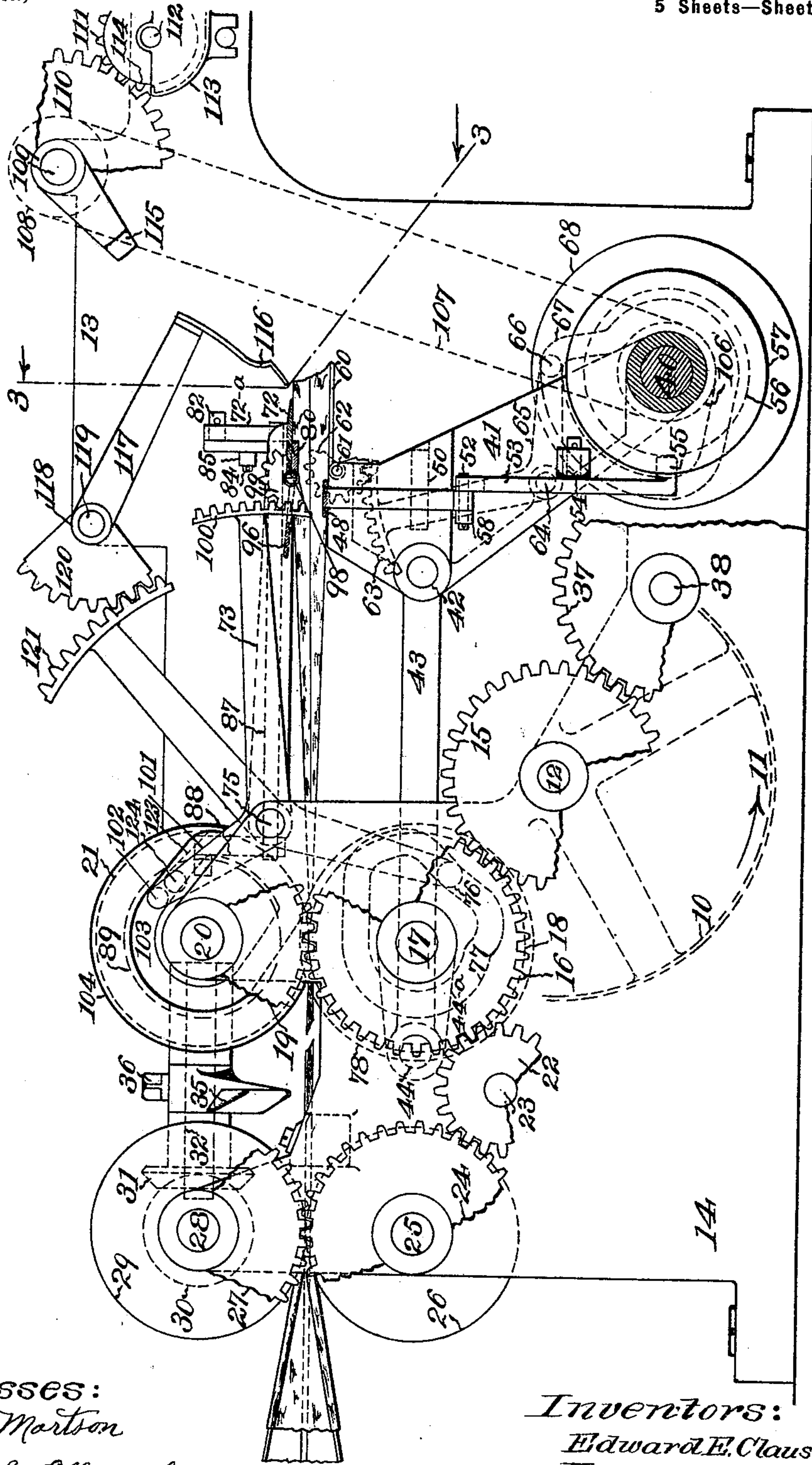
BAG MACHINE.

(Application filed Mar. 19, 1898.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



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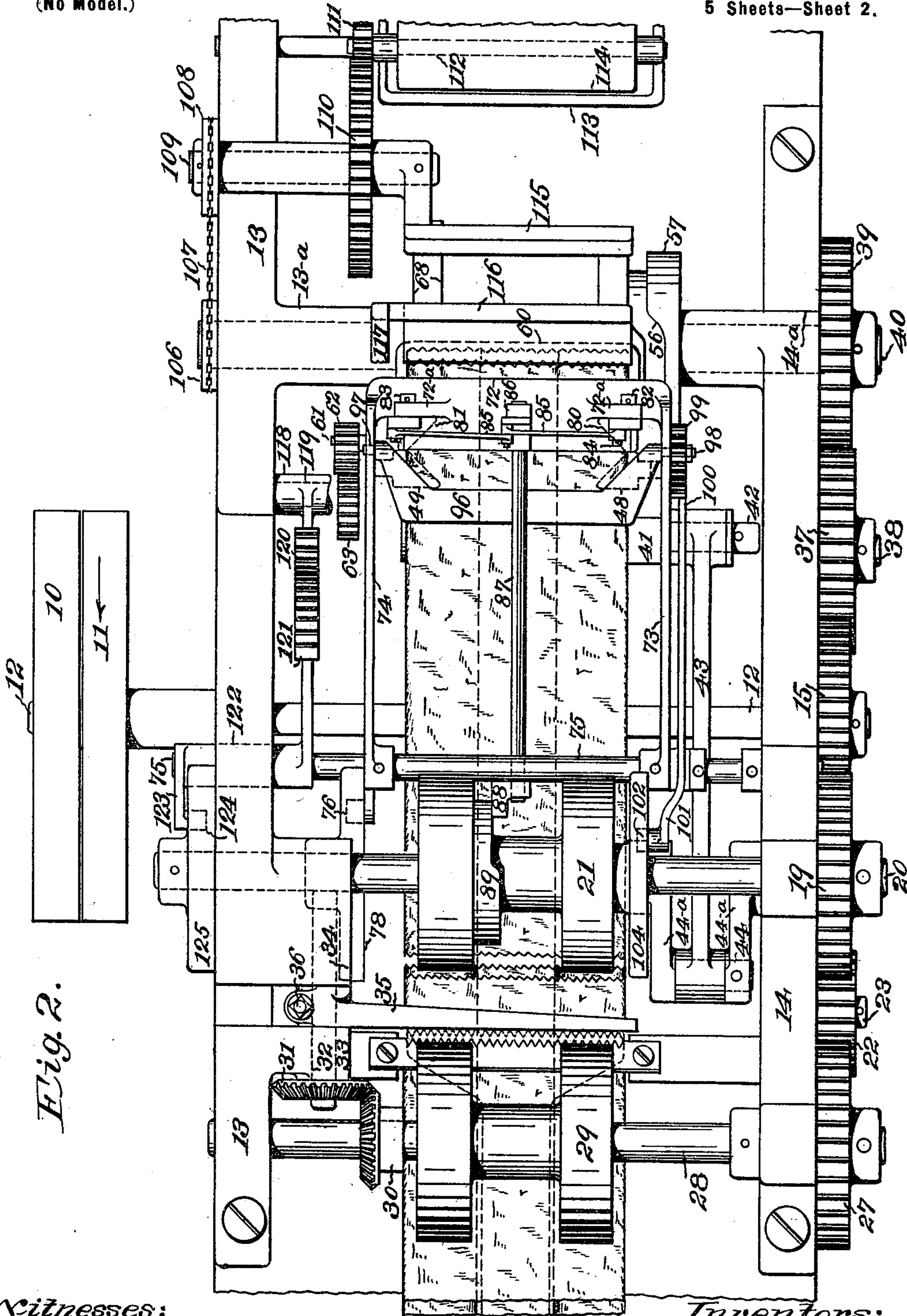


Fig. 2.

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Fig. 6.

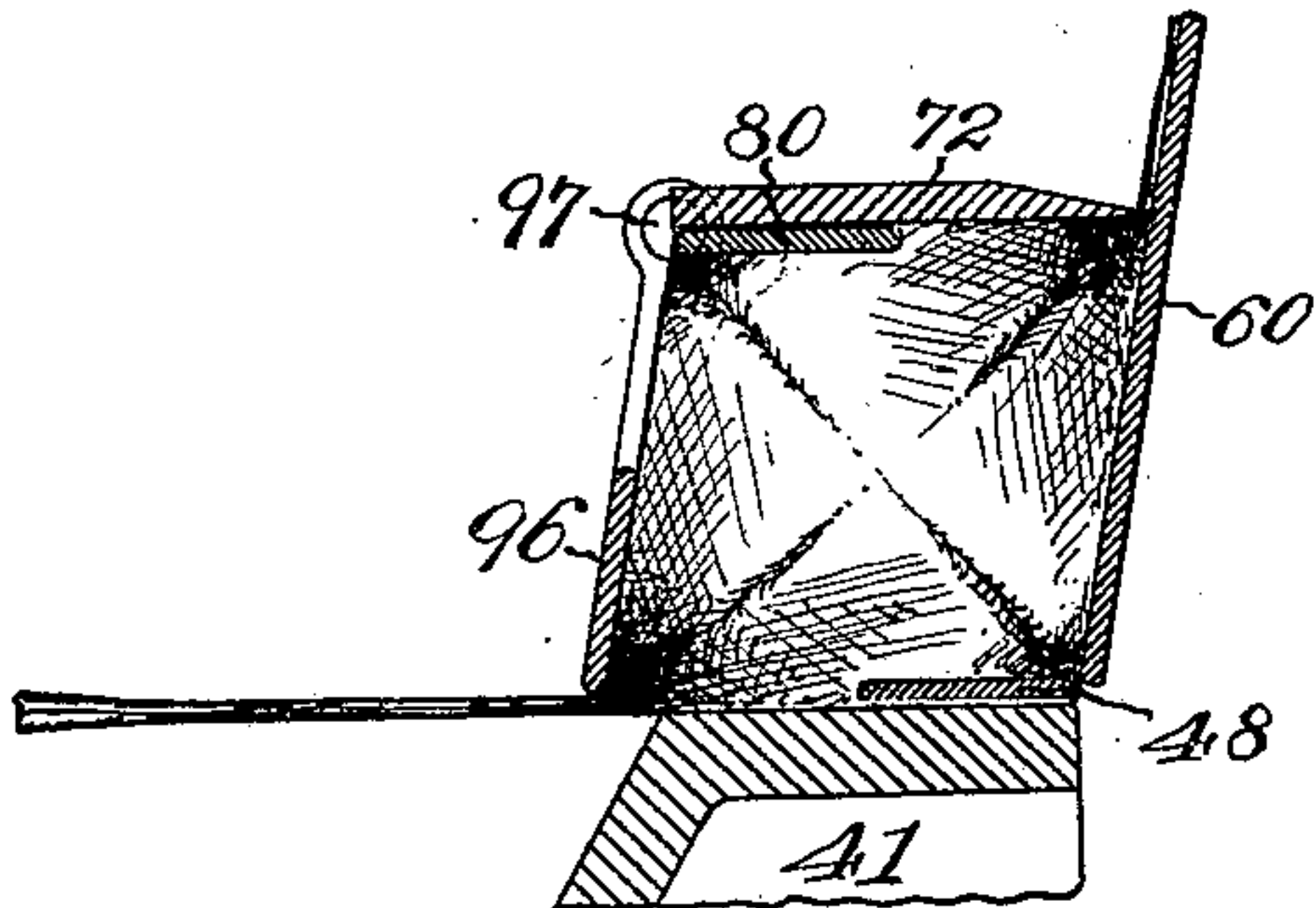
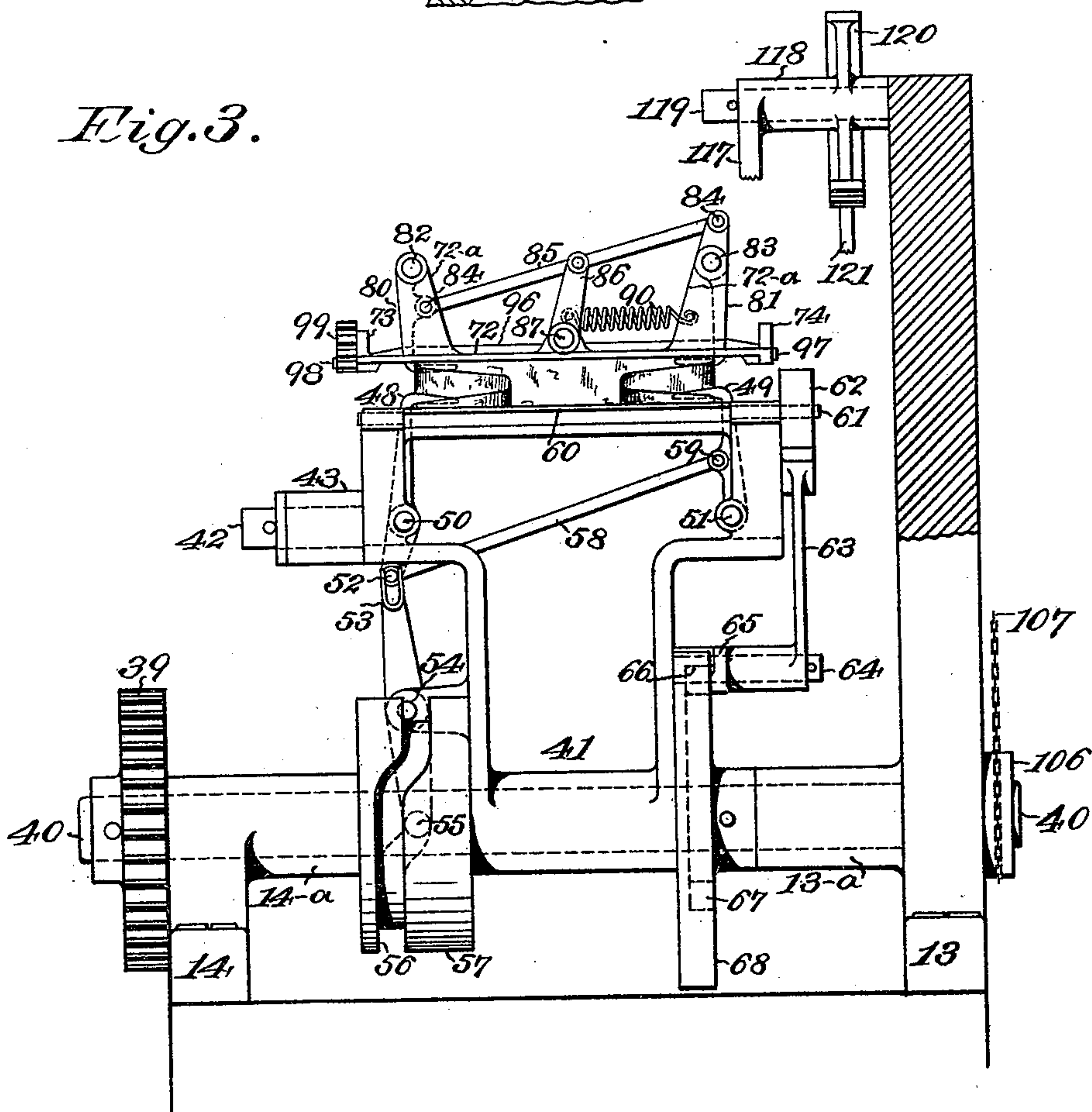


Fig. 3.



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5 Sheets—Sheet 4.

Fig. 4.

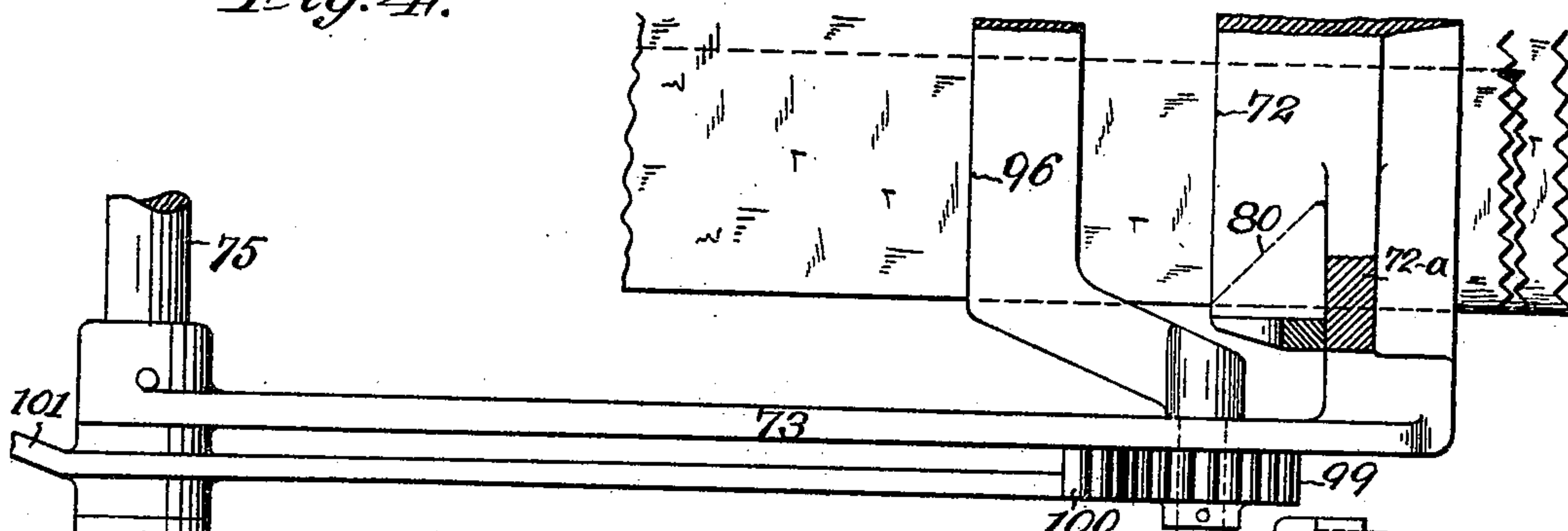


Fig. 5.

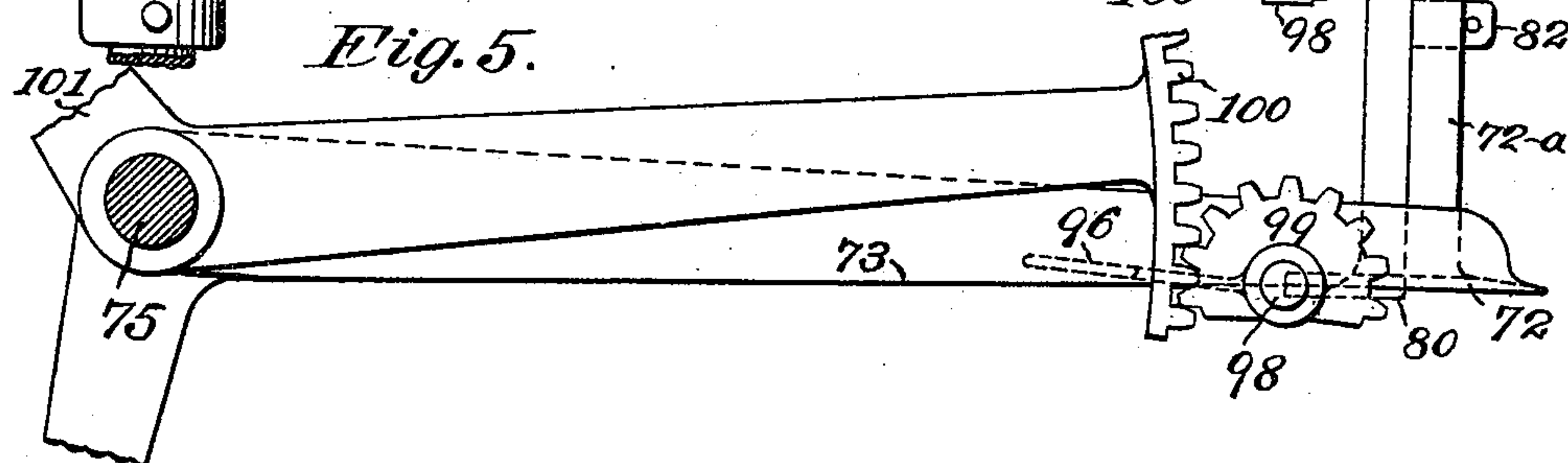


Fig. 7.

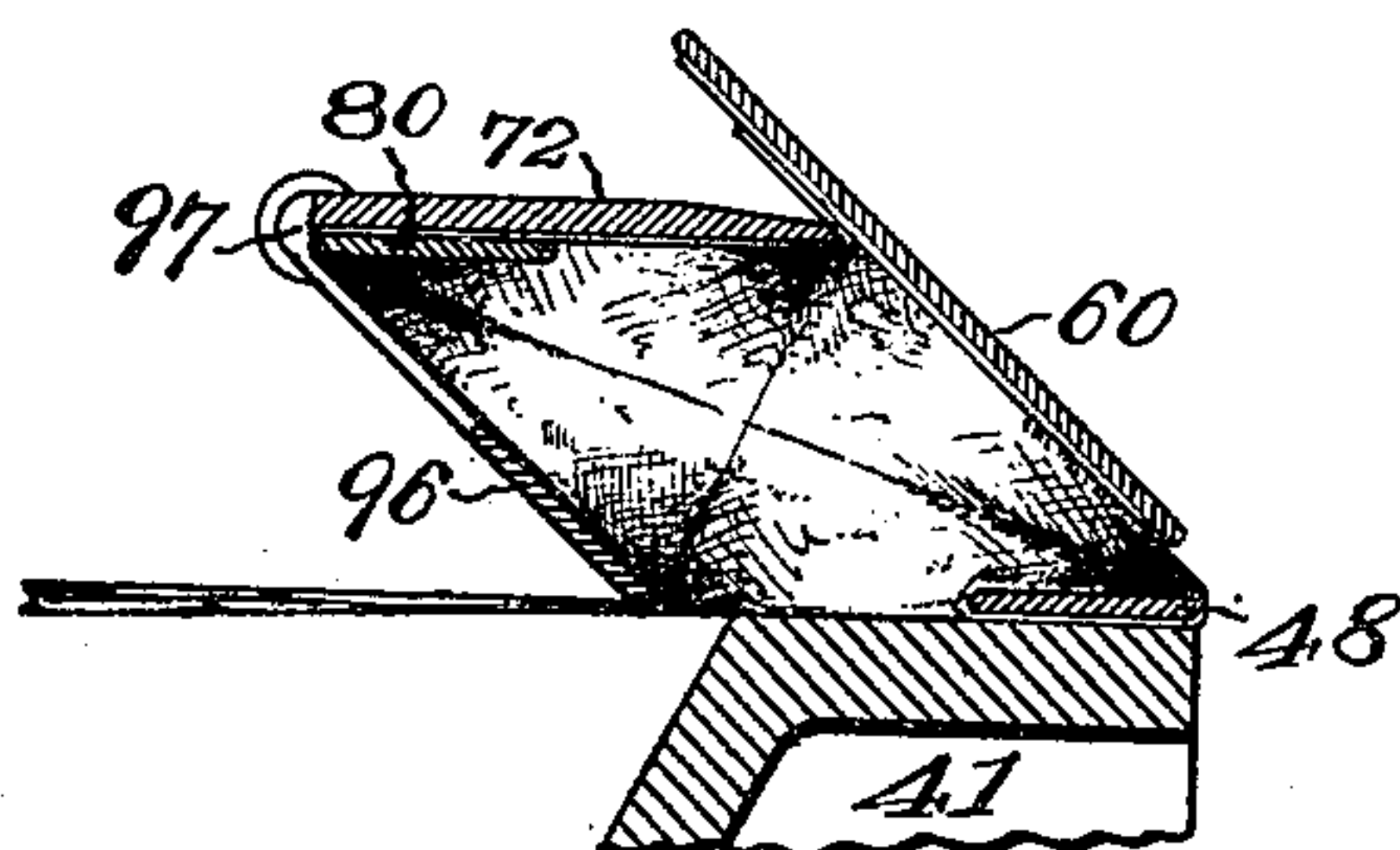
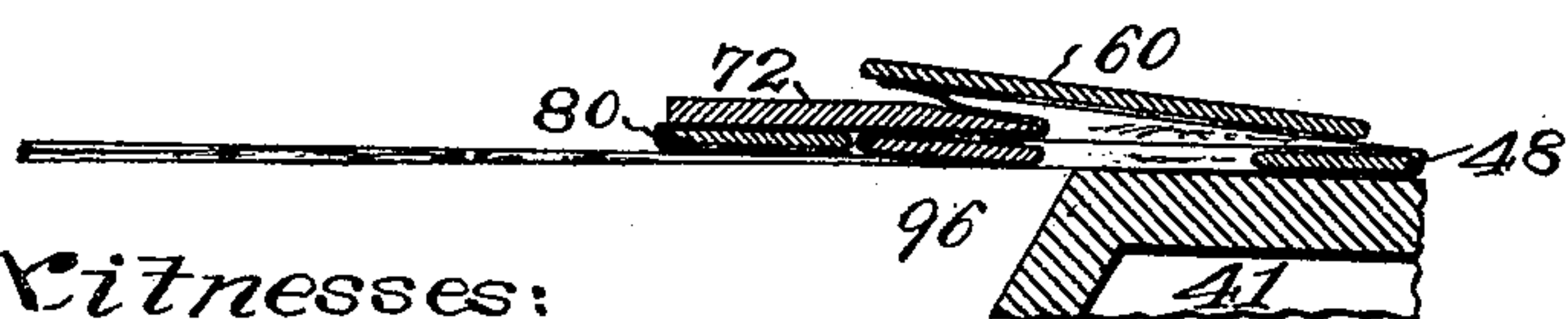


Fig. 8.



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5 Sheets—Sheet 5.

Fig. 9.

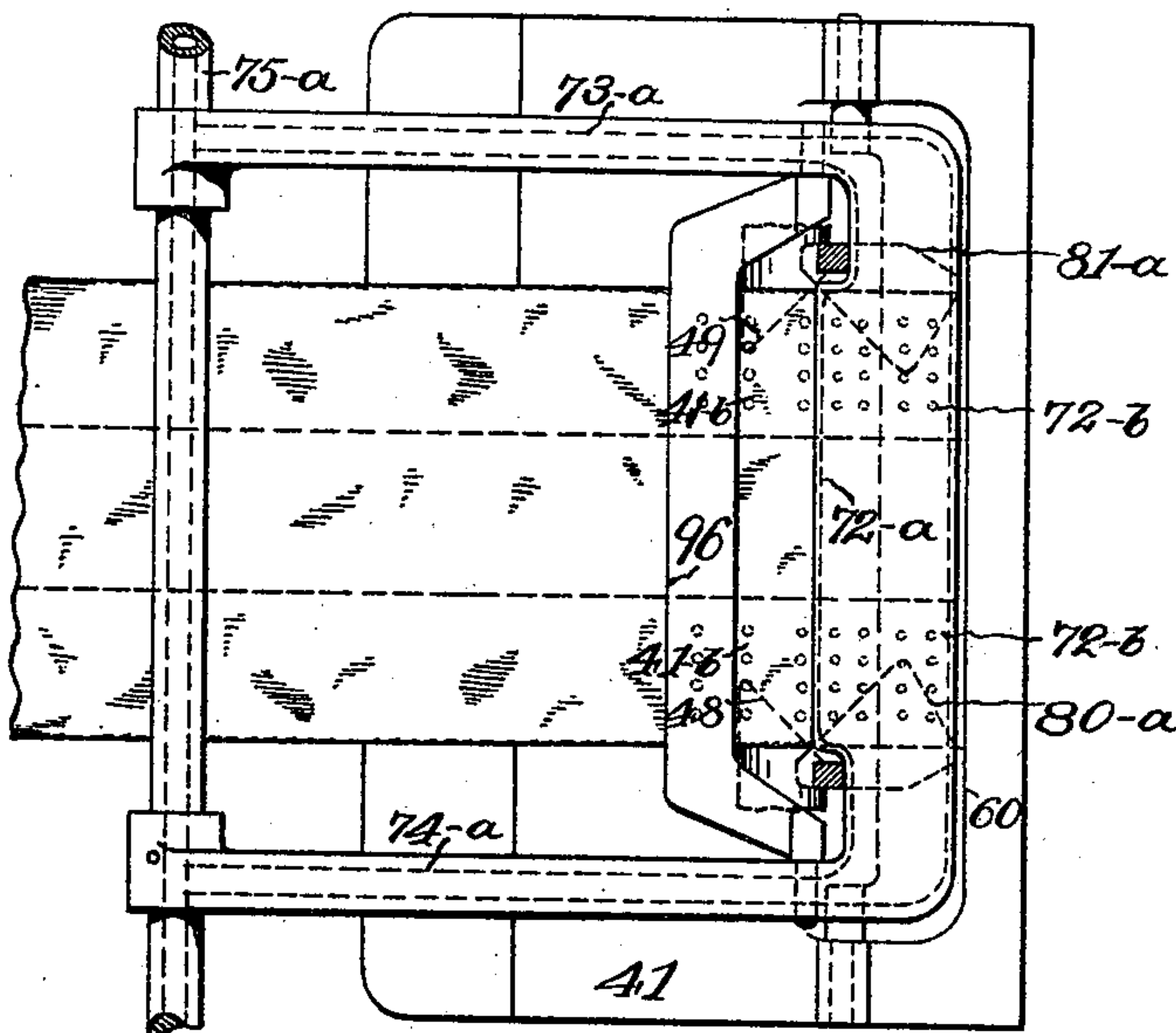


Fig. 10.

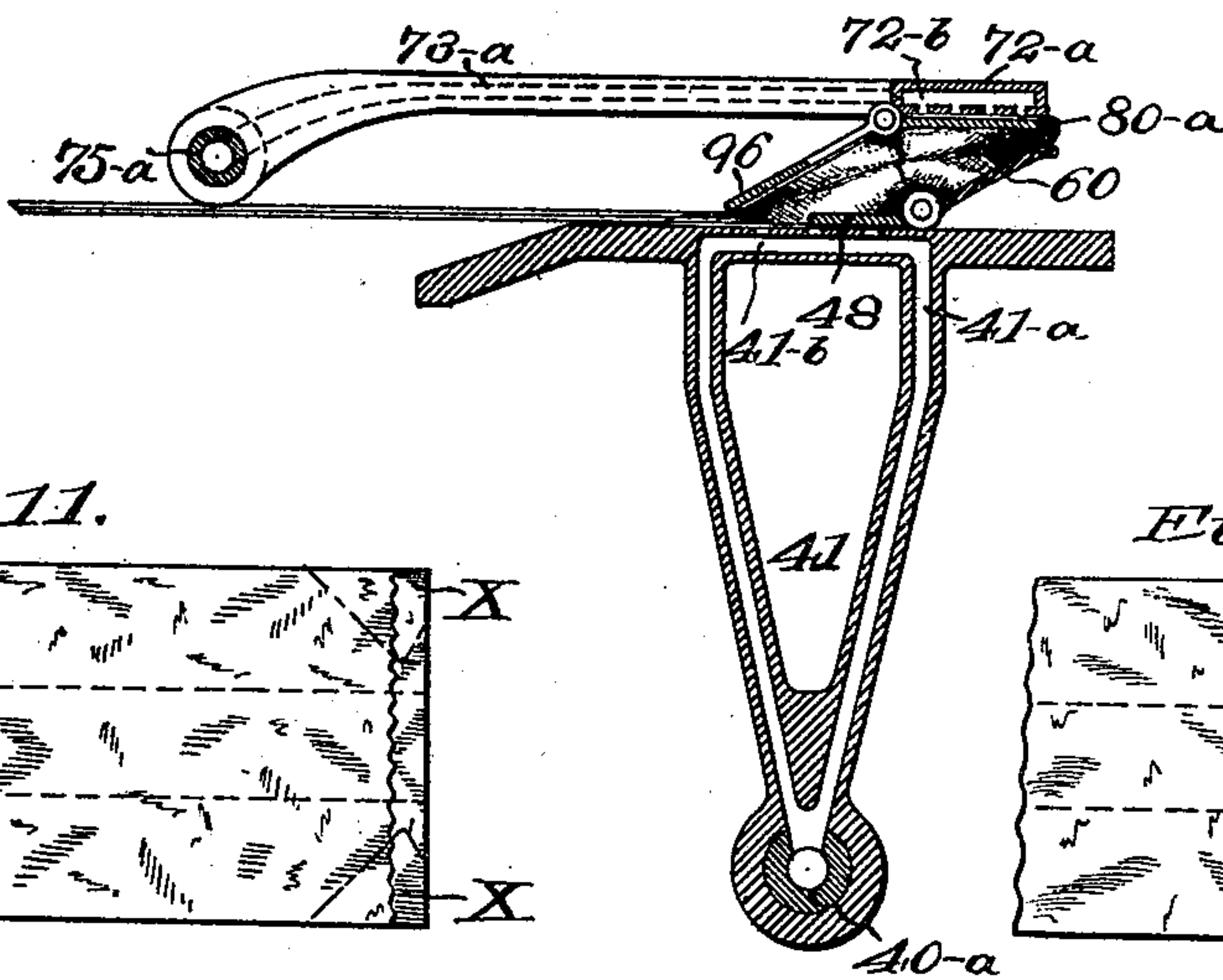


Fig. 11.

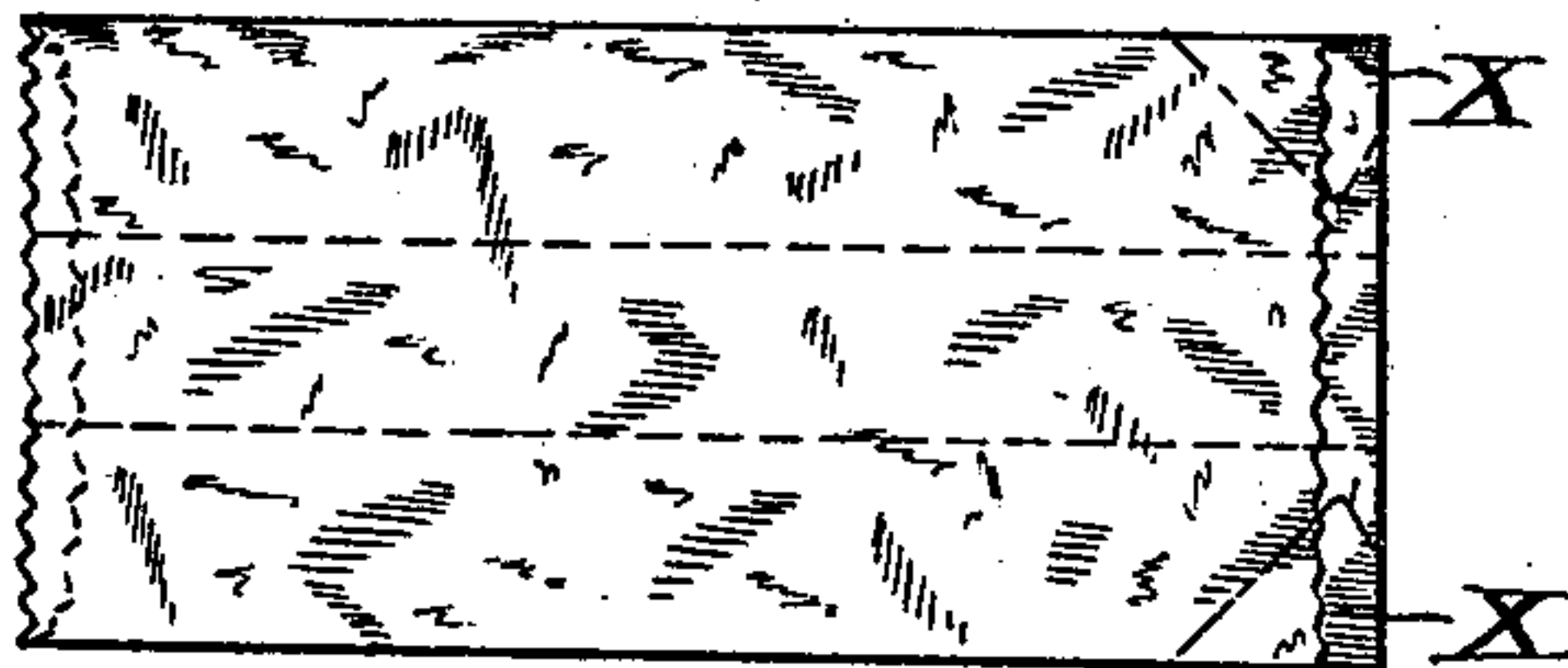


Fig. 13.

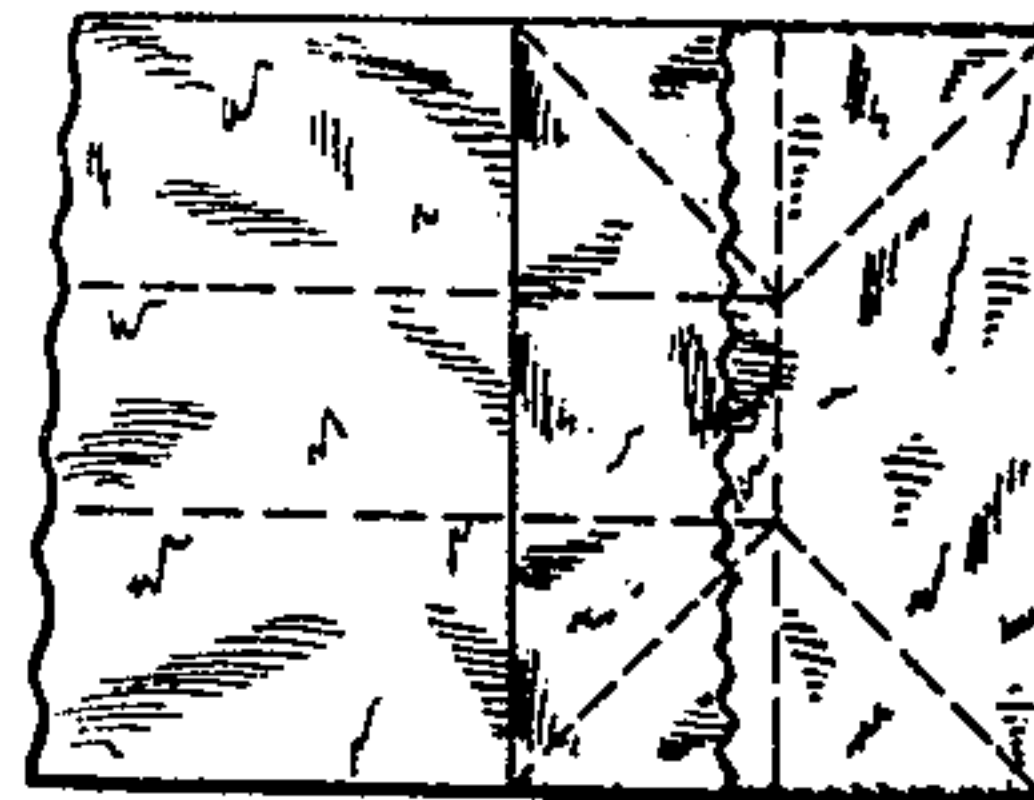
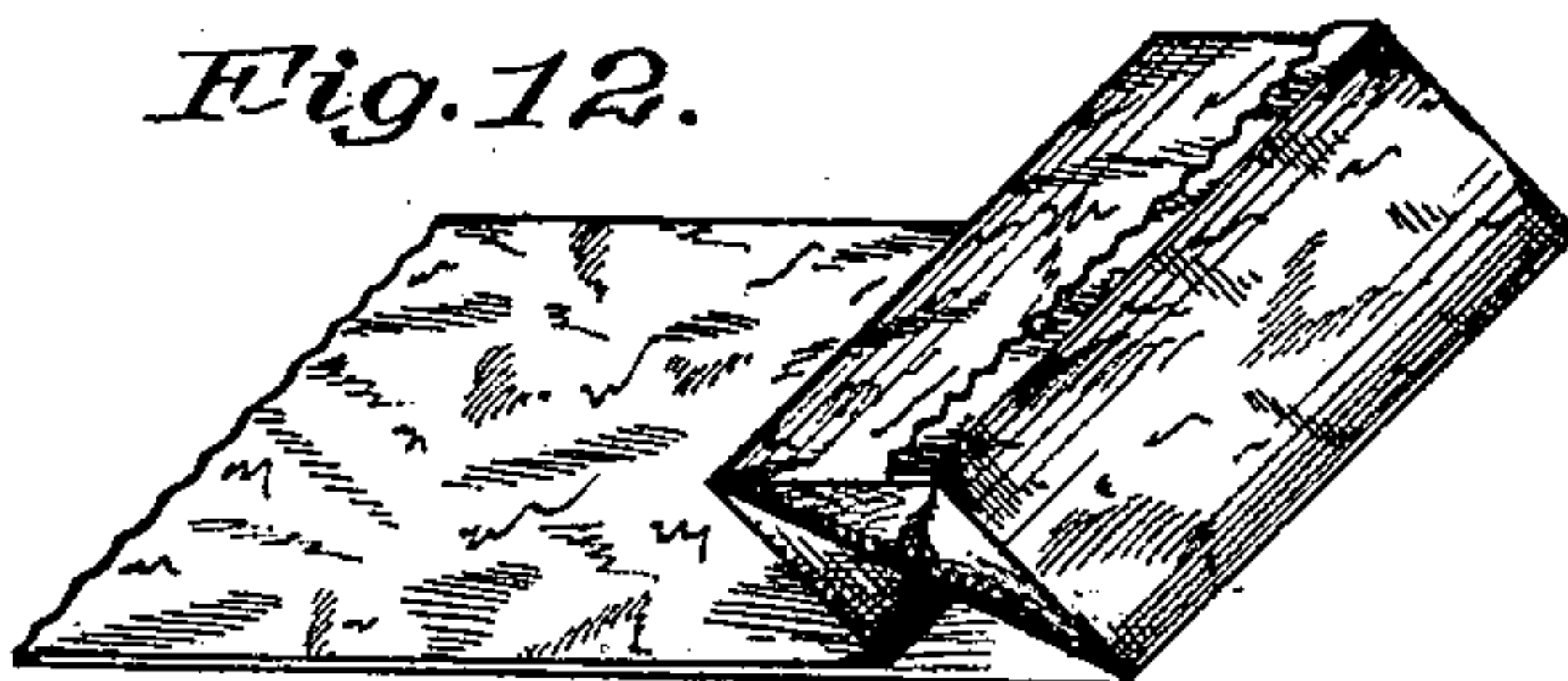


Fig. 12.



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UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN, OF HARTFORD, CONNECTICUT, AND HERMAN ELSAS,
OF NEW YORK, N. Y.; SAID CLAUSSEN ASSIGNOR TO SAID ELSAS.

BAG-MACHINE.

SPECIFICATION forming part of Letters Patent No. 623,983, dated May 2, 1899.

Application filed March 19, 1898. Serial No. 674,416. (No model.)

To all whom it may concern:

Be it known that we, EDWARD E. CLAUSSEN, residing at Hartford, in the county of Hartford and State of Connecticut, and HERMAN ELSAS, residing at New York, borough of Manhattan, in the county and State of New York, citizens of the United States, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact specification.

This invention relates to improved machinery for automatically manufacturing square-bottom paper bags from tucked paper tubing, and as herein shown being adapted to form the complete bottom, having the inwardly-projecting triangular folds and the pasted bottom seam folded transversely to that bottom, or the same is applicable and adapted to a converter to transform such bags made in accordance with Letters Patent granted to L. C. Crowell February 20, 1872, No. 123,811, and known in commerce as the "square" bag, and convert the same into the square-bottom bag.

The object of our invention is to provide simple, reliable, and rapid means for completing the bag-bottom by devices and mechanism in a single operation, which mechanisms are equally applicable in converting the square bag into the square-bottom paper bag by omitting certain parts of the mechanism, as will be more fully explained hereinafter.

In the preferred embodiment of our invention herein shown and described the bottom-forming mechanisms consist of a suitable reciprocating folding-bed provided with beveled side clips, which hold the lower ply of the tube and the lower tuck securely thereto and also having the lifting-plate hinged in suitable bearings to that folding-bed, all mounted below the normal plane of feed of the bag-blank. Above the normal plane of feed of that bag-blank is mounted an oscillatory retaining-plate provided with nippers which hold the upper ply of the tube and the upper tucks to that retaining-plate and having in suitable bearings hinged thereto the vibratory tucker-plate, with its defining edge, which forms the characteristic primary transverse folding-line across the bag-blank.

The mechanism just described forms, sub-

stantially, at any stage during the folding operation a parallelogram, this being especially true in a carriage having a straight-line reciprocating motion (as well known to the art) instead of a rocking reciprocating carriage, as shown in the drawings.

In the drawings accompanying and forming a part of this specification, Figure 1 represents a side view of our improved paper-bag machine, partly in section, having the former that folds the tucked paper tube broken away and showing the bag-blank severed from the tucked tube and the blank gripped by the side clips to the carriage and by the side nippers to the retaining-plate ready for the folding operation to begin. Fig. 2 is a plan view of that which is shown in Fig. 1. Fig. 3 is a sectional end elevation on line 3 3 of Fig. 1, taken in the direction of the arrows. Fig. 4 is a fractional plan view of the retaining-plate with its side nippers and vibrating tucker-plate attached, the same being drawn on an enlarged scale to more clearly present the detail construction. Fig. 5 is a side elevation of that which is shown in Fig. 4. Figs. 6, 7, and 8 are side views of the blank at different stages when the bottom-forming mechanisms are in operation thereon. Fig. 9 is a plan view of the folding instrumentalities constructed and operating upon a pasted and completed square bag and converting the same into the square-bottom bag. Fig. 10 is a side view of that which is shown in Fig. 9. Fig. 11 shows the square paper bag made in accordance with Letters Patent No. 123,811, granted to L. C. Crowell February 20, 1872. Fig. 12 is a perspective view of the bag nearly converted into the square-bottom paper-bag. Fig. 13 shows the completed bag in the square-bottom form, having inwardly-inclined longitudinal folds or tucks and the inwardly-projecting triangular folds.

The reference-numerals herein used indicate, respectively, the same parts in the different figures of the drawings. The arrows indicate, without further description, the direction of movement of parts. In the accompanying drawings the position of the various instrumentalities is shown to best advantage, irrespective of the relative position these parts may have to their respective cam-grooves, and

the same is true of all parts hereinafter mentioned, it being considered sufficient for the purpose of this description to assume that the cams are properly cut to effect the various operations required at the proper times and to the proper extent.

For more clearness the gears 15, 16, 19, 22, 24, 27, and 37 are broken away; but they are to be understood as having the teeth cut around their full circumference.

A description will first be given of the construction and operation of each section and of each motion of the machine, and afterward their combined mode of operation will be described.

Power is communicated to the machine by the pulley 10 in the direction of the arrow 11 and is fastened to the shaft 12, which is journaled in the frames 13 and 14 of any suitable construction for carrying the various mechanisms of the machine. The shaft 12 carries on the right-hand side of the machine, adjacent to the frame 14, the gear 15, which meshes into the lower drawing-roll gear 16, fastened on the shaft 17, which carries securely fastened thereto the lower drawing-roll 18. The gear 16 engages the gear 19, which is securely held on the shaft 20, which has mounted thereon the upper drawing-roll 21. The gear 16 also meshes into the intermediate gear 22, journaled on the stud 23, fastened on the outside of the frame 14, and that intermediate is geared into the lower roll-gear 24, which is rigidly mounted on the shaft 25, which carries the roll 26. The gear 24 meshes again into the gear 27, fastened on the shaft 28, which carries the upper roll 29. The shafts 17, 20, 25, and 28 are all journaled in the frames 13 and 14, as illustrated in the drawings, Figs. 1 and 2, and have the rolls 18, 21, 26, and 29 journaled thereon, the former serving to draw the tubing from the tube-forming section into the machine and the latter causing to hold the tube to be severed and then deliver the tube-blank into the folding apparatus.

As a simple and convenient means for severing the bag-blanks from the tube, we have represented the shaft 28, carrying rigidly connected thereto, on the left-hand side next the drawing-roll 29, the miter 30, meshing into the miter 31, fastened on the shaft 32, journaled in projecting bearings 33 and 34 of the frame 13. The striker-arm 35 is clamped to the shaft 32 by the clamp-screw 36 and revolves in unison therewith, and the gears 16, 19, 24, 27, 30, and 31 are so geared in relation to one another that to each revolution of the striker-arm a length of tubing is drawn forward sufficient to make the body and the bottom-forming end of the bag-blank.

The connecting mechanism between the tube forming and severing devices just explained and the bottom-forming mechanism is as follows:

The gear 15 meshes into the gear 37, journaled on the stud 38 and fastened in and on

the outside of the frame 14, and that gear engages the gear 39, fastened on the shaft 40, journaled in projecting hubs 13^a and 14^a of the frames 13 and 14, respectively.

Loosely mounted on the shaft 40 for oscillatory motion is the carriage 41, provided on the right-hand side with the stud 42, which is engaged by the connecting-rod 43, having its forward end connected to the crank-pin 44, which is fastened to the crank-arms 44^a, rigidly connected to the shaft 17, and whereby the carriage 41 is reciprocated in unison with the drawing-rolls. Mounted on each side of the carriage 41 are the bevel-edged side clips 48 and 49, pivoted to the carriage by the studs 50 and 51 in such a position that the intersecting line of the edge of the bevel-edged side clips with the edge of the paper-bag blank will eventually form the corners of one side of the completed bag-bottom. The side clip 48 is provided with the stud 52, which is engaged by the bifurcated lever 53, journaled in the projecting hub of the carriage on the stud 54. The lower projecting arm of the lever 53 is provided with a roller projection 55, engaging the cam-groove 56 of the cam 57. The stud 52 is also engaged by a connecting-rod 58, which engages a similar stud 59 of the side clip 49. By the means just described the side clips 48 and 49 are caused to be moved toward each other at proper intervals when the leading end of the paper-bag blank is fed forward into its proper position and caused to move away from each other when the bag-bottom is completed and ready to be transferred into proper delivery mechanism.

Hinged to the front side of the carriage 41, in suitable bearings, is the oscillatory lifting-plate 60 on shaft 61, the center of which practically coincides with a line passing through the intersecting points of the bevel-edged side clips and the edges of the paper-bag blank. The left-hand end of the shaft 61 has fastened thereto the sector 62, engaging the sector 63 and mounted on the pivot 64. The hub of the sector 63 is provided with the forward-projecting arm 65, having a roller projection 66 engaging the cam-groove 67 of the cam 68, and whereby the lifting-plate 60 is caused to be operated through the arc of a circle of about one hundred and eighty degrees simultaneously when the carriage 41 is caused to be oscillated away from the drawing-rolls by means of the crank 44^a.

The bottom-forming mechanism, which operates above the normal line of feed of the paper-bag blank, consists of the retaining-plate with its bevel-edged side nippers and having hinged thereto the vibratory tucker-plate, which will now be described.

Above the carriage 41 is placed the retaining-plate 72, which is joined to the arms 73 and 74, which are securely held on the shaft 75. The lower projecting end of the arm 74 carries the roller projection 76, engaging the cam-groove 77 of the cam 78, and whereby the retaining-plate is raised and lowered from

the top surface of the carriage 41 as the same is propelled away from the drawing-rolls.

Mounted on opposite sides on the retaining-plate 72 are the bevel-edged side nippers 80 and 81, pivoted by pivots 82 and 83 in lugs 72^a of the retaining-plate 72. The side nippers 80 and 81 are provided with studs 84 and operatively joined by the connecting-rod 85, which is controlled by the arm 86, fastened to the shaft 87, and which carries on the rearward end the cam-arm 88, engaging the cam 89, fastened to the roll 21. A spring 90 has the tendency to always keep the side nippers in the normally-closed position, whereas the opening of the same is controlled and effected by the cam 89. In the arms 73 and 74 of the retaining-plate 72 is mounted the vibratory tucker-plate 96 on trunnions 97 and 98 in substantially such a position that the line passing through the centers of the trunnions coincides with a line passing through the intersecting points of the side nippers and the edges of the paper blank, which line will eventually form an edge of the bag-bottom. The right-hand trunnion 98 has fastened thereto the sector 99, meshing into the sector 100, having on its rear end the arm 101, with the roller projection 102 engaging the cam-groove 103 of the cam 104, and whereby a vibratory motion is imparted to the tucker-plate 96 of about one hundred and eighty degrees.

The means for applying the paste to the paper-bag blank will now be described.

Continuous rotary motion is transferred from the shaft 40 by means of the sprocket-wheel 106 and chain 107 to the sprocket-wheel 108, fastened on the shaft 109 and journaled in the frame 13. Rigidly mounted on the shaft 109 is the gear 110, meshing into the gear 111, held on the paster-roll shaft 112, journaled in the paste-box 113, in which the paste-roll 114 revolves. On the inner side of the frame 13 and adjacent to the gear 110 on the shaft 109 is mounted the paste-segment 115, which rotates in unison with the shaft 40 by the means just described and whereby paste is delivered from the paste-roll 114 to the paste-segment 115. The paste is delivered from the paste-segment 115 to the paste-finger 116 by the engagement of the finger 116 with that segment 115. At proper predetermined intervals the paste-finger 116 has a vibratory motion imparted thereto by means of the following mechanism: The paste-finger 116 is mounted upon the arm 117, which is attached to the hub 118, pivoted upon the shaft 119, having the sector 120 connected thereto. That sector engages the sector 121, held to the sleeve 122, journaled in the frame 13 of the machine, and carries on the outside of that sleeve the arm 123, provided with the roller projection 124, engaging a groove in the cam 125. The timing of the cam 125, that causes to oscillate the paste-finger 116 in relation to the oscillation of the carriage and the rotation of the paste-segment 115, is such

that paste is delivered from the segment 115 to the finger 116 and thence to the bag-blank when the carriage 41 is in its position nearest the drawing-rolls, as shown in the drawings of Figs. 1 and 2.

In Figs. 9 and 10 we have shown the machine adapted for converting a pasted and completed square bag, as shown in Fig. 11, into the square-bottom paper bag of Fig. 13, and the same may be used as a converter whereby the bags are fed into the apparatus by hand or the same may be used as an attachment and connected to any of the present styles of machines, forming an adjunct thereto. The mechanism of the foregoing description is identical with the mechanism of this converter, with the exception of the minor detail construction of the retaining-plate and its clips and omitting the tube delivering, severing, and paste devices. The carriage 41 has in this case in its preferred construction an exhaust-chamber 41^a on its lower side and provided on its top with perforations 41^b, through which the air is exhausted by means of the hollow shaft 40^a. The side clips 48, the lifting-plate 60, and the tucker-plate 96 are identical with the foregoing description and therefore need no further explanation. The retaining-plate 72^a is also shown as a hollow suction-chamber having perforations 72^b on its lower side and being effectively connected by means of the hollow arms 73^a and 74^a and by the shaft 75^a to any well-known exhaust mechanism, as a blower or an air-pump. The bevel-edged side nippers 80^a and 81^a are made wider than 80 and 81 of the foregoing construction, so as to clip the pasted seam at the corners X X, as shown in Fig. 11, thereby preventing the same from opening during the process of converting the bag into the square-bottom bag. The means whereby the air is exhausted from the hollow suction-chambers 41^a and 72^a is accomplished in a great many ways well known to the art, and we do not wish to limit our invention to any particular means. The object of introducing these suction devices is to draw the upper and lower plies of the tube away from each other, so that the clips and nippers may enter their respective tucks more readily, which would be necessary if the bags were fed into the converter after having been stored away or pressed together, thereby creasing the edges of the tube and making it impossible for the folding devices to work properly.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a paper-bag machine, the combination of the traveling folding-bed, devices to hold the lower ply of a bag-blank to the folding-bed, the retaining-plate capable of an oscillatory motion, devices adapted to hold the upper ply of the bag-blank to the retaining-plate, the tucker-plate and the lifting-plate all combined and operating to form substan-

tially a parallelogram during the forward movement of the carriage.

2. In a paper-bag machine, the combination of the traveling folding-bed, devices adapted to close and hold, and also to open and release, respectively, the lower ply of the bag-blank at predetermined intervals to and from the folding-bed, the retaining-plate capable of an oscillatory motion and provided with devices to close and hold, and also to open and release, respectively, the upper ply of the bag-blank at predetermined intervals to and from the retaining-plate, the tucker-plate and the lifting-plate, all combined and operating to form substantially a parallelogram during the formation of the bag-bottom and the forward movement of the carriage.

3. The combination of the folding-bed, the retaining-plate, the tucker-plate and the lifting-plate combined and operating to form substantially a parallelogram during the formation of the bag, substantially as described.

4. The combination of the folding-bed, side clips adapted to close on the top surface of that folding-bed, the retaining-plate, side nippers adapted to close on the lower surface of that retaining-plate, the tucker-plate and the lifting-plate, all combined and operating to produce a square-bottom paper bag.

5. The combination of a reciprocating folding-bed, the side clips adapted to hold the lower ply of a tucked-paper tube to that folding-bed, the retaining-plate adapted to be raised and lowered over the folding-bed, side nippers mounted to that retaining-plate, the tucker-plate operating substantially as described to form the transverse folding-line, the lifting-plate 60 and the pasting-finger, all operating to complete the bag by a single operation.

6. In a paper-bag machine, the combination of a reciprocating carriage, side clips carried by that carriage, means for opening and closing those side clips at predetermined intervals, the lifting-plate hinged to the carriage, the retaining-plate adapted to be raised and lowered over the folding-surface of the carriage, side nippers mounted to the retaining-plate, the tucker-plate mounted on the retaining-plate, all combined and operating to form a rhomb at any stage of the formation of the bag.

7. In a paper-bag machine, the combination of a reciprocating carriage, side clips carried by that carriage, means for opening and closing those side clips at predetermined inter-

vals by the cam, the lifting-plate hinged to the carriage and operated by a cam, the retaining-plate adapted to be raised and lowered over the folding-surface of the carriage by means of the cam, side nippers mounted to the retaining-plate and means of operating the same at predetermined intervals, the tucker-plate mounted on the retaining-plate, all combined and operating to form a rhomb at any stage of the formation of the bag.

8. In a paper-bag machine, the combination of folding devices to convert a bag having longitudinal folds and a cross-folded end flap into a bag having longitudinal folds and the inwardly-projecting triangular folds, consisting of a folding-bed, perforations 41^b in the top surface of that folding-bed for the purpose specified, side clips 80^a and 81^a, the retaining-plate 72^a, perforations 72^b in the lower surface of that retaining-plate for the purpose specified, side nippers mounted on the retaining-plate, the tucker-plate mounted on the retaining-plate to form the transverse crease, all combined and operating substantially as described.

9. In a paper-bag machine, the combination of folding devices to convert a bag having longitudinal folds and a cross-folded end flap into a bag-blank having longitudinal folds and the inwardly-projecting triangular folds, consisting of the folding-bed, means for reciprocating that folding-bed, perforations 41^b in the top surface of that folding-bed substantially as described and for the purpose set forth, side clips 80^a and 81^a mounted to that folding-bed and means for moving the same toward and away from each other, the retaining-plate 72^a, provided with perforations 72^b in the lower surface thereof and for the purpose specified, side nippers mounted on the retaining-plate and means for moving the same toward and away from each other, the tucker-plate mounted on the retaining-plate to form the transverse crease, means for operating that tucker-plate, all combined and operating to convert the square bag into the square-bottom paper bag.

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